



*Dedicated to the
Science of Motion*

WORLD HEADQUARTERS

Aerotech, Inc.
101 Zeta Drive
Pittsburgh, PA 15238
Ph: 412-963-7470
Fax: 412-963-7459
Email: sales@ aerotech.com

AEROTECH WORLDWIDE

United States • Germany • United Kingdom • Japan • China • Taiwan • France

www.aerotech.com

Company: 台灣大學物理系高能實驗室R520
ADD: 台北市大安區羅斯福路四段1號

Quotation Number: 116565-07

Date: 4-May-2017
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Contact: 周建宏 Chine-Hung Chou 黃子娟 Jenny Huang

CC: [TEL: +886-2-3366-5146](tel:+886-2-3366-5146)

Project Name: Positioning and Motion Control System

Fax: [FAX: +886-2-2369-3472](tel:+886-2-2369-3472)

Email: chou@hep1.phys.ntu.edu.tw
jenny@hep1.phys.ntu.edu.tw

Thank you for your interest in Aerotech products. Based on our most recent conversation, we are pleased to provide the following quotation on the motion control equipment required for your **Module Assembly Gantry**.

The scope of this quotation does not include:
- Vision

QUOTE REVISION HISTORY:

-00	22-Mar-17	Original Quotation
-01	23-Mar-17	Add DAP wordings
-02	24-Mar-17	Add payment term, ES wording, and training wordings
-03	29-Mar-17	Change to 115 VAC NPAQ, update the A3200 description , update scope of offering info, update lead time info
-04	19-Apr-17	Spec table update to reflect SN#121652
-05	25-Apr-17	Spec table update to reflect SN#121652
-06	28-Apr-17	Add acceptance criteria
-07	4-May-17	Update the wordings

PRODUCT INFORMATION:

- [General Information](#)
- [Software Downloads](#)
- [Manual Downloads](#)
- [2D/3D Drawings](#)
- [Technical Support FAQ](#)
- [Software Release Notes](#)

SYSTEM SPECIFICATIONS:

Unless specified below all stages are tested as single axis to single axis specifications in a 20 degree C temperature controlled metrology area. Specifications are static, and per the Aerotech website.

XY GANTRY	Z Axis	Theta Axis
Electrical Resolution: 0.001 um	0.05 um	0.1 arc sec
Accuracy: +/- 5um	+/-2.0um	6 arc sec
Repeatability: +/- 2um	+/-1.0 um	3 arc sec
		1-2 kg (vacuum tooling plus parts
Load on Stages: Z & T stages, T-payload (0.5kg), and 10kg for other equipment max	15 kg (est) max	<250 grams), hanging from stage/mounted upside down
Load CG: Mounted on Z axis	<75mm	centered near tabletop (<10 cm)
Min / Max Velocity: 1mm to 400mm/sec	15 mm/s max	Slow: <10-20 degrees/sec.
Acceleration: <0.3g	Not Critical	Not Critical

Move Profile: Point to Point

lower workpiece as
slow as possible

few mrad to 10s of
degrees

SYSTEM COMPONENTS:

ITEM	QTY	PART NUMBER/DESCRIPTION	PRICE	AMOUNT
Mechanical Components: 1000 x 1000 mm travel				
XYZT AGS10000 Series Gantry				
1	1	AGS10000-1250-1250/ESXXXX/ATS150-100/ADRS-150 GANTRY POSITIONER AGS10000 gantry package with 1250 x 1250 mm travel. Includes 100 mm vertical stage and rotary stage. System components as listed below:	\$132,930	\$132,930
	1	(XY AXIS) ESXXXX AGS10000-1250-1250-10X2-10-LT100AS-LT100AS-BP-MB <i>AGS10,000 Series Cartesian Gantry System</i> <i>1250mm travel, dual motor drive X, X1 (gantry) axis</i> <i>(2) Linear encoders with 20 micron AS output</i> <i>1250mm travel, single motor drive Y (cross) axis</i> <i>(1) Linear encoders with 20 micron AS output</i> <i>Cable management system.</i> <i>XYZT axes assembled, orthogonal to 5 arc seconds.</i> <i>Hard-coated aluminum base plate; with up to 64 M6 or 1/4 tapped holes.</i> <i>with up to 64 M6 or 1/4 tapped holes.</i> <i>Clearance below inverted ADRS200 tabletop to baseplate will be 175mm</i> Machine Base Weldment - open frame with leveling feet. (T AXIS) ADRS150-AS <i>The ADRS series, with its direct-drive technology and low profile, provides a superior alternative to belt- and worm-drive stages. The low maintenance and high-throughput characteristics of the ADRS series provide a stage that yields the lowest total cost of ownership. The ADRS is configured as follows.</i> <i>-150: 150mm wide direct-drive rotary stage with 11.7N-m peak torque output</i> <i>-M: Metric dimension mounting pattern and holes</i> <i>-A: Low speed, high torque-constant winding (standard)</i> <i>-AS: Standard feedback device, 1vpp sine wave output, 10,000lines/rev resolution on ADRS-150</i> <i>-NS: Top labyrinth seal, no bottom seal (standard)</i> Remarks: <i>The Part Number ESXXXX is a series of non-assigned numbers, that will be assigned after order placement. This is because of the nature of ES (Engineered Systems), which means customized for specific customers.</i> <i>Every customized system will have a unique ES number, and the ES system can only be sold to the specific customer.</i> <i>The ESXXXX number will be provided after order placement, therefore, if comparing the ESXXXX to ES12345 (i.e.) , these basically means before and after the number is assigned.</i> (Z AXIS) ATS150-100-BMS60-E1000AS-BRK1 <i>100mm travel stage and BMS60 motor with brake and sinewave encoder.</i>		
	1	Alignment- PA5-CUSTOM <i>YZ assembly; 5 arc sec orthogonality</i>		
	1	Alignment- PA5Z-CUSTOM <i>ZT assembly; 5 arc sec orthogonality</i>		
	1	HALAR for the Gantry <i>High accuracy system - linear error correction for accuracy</i>		
	1	Gantry Alignment- PA5-CUSTOM		
	2	HALAR for ATS150 and ADRS stages <i>High accuracy system - linear error correction for accuracy</i>		

2	1	<p>A3200-NPAQ CONTROL SYSTEM A3200 motion controller and NPaq amplifier. Gantry Controls package consisting of the following components:</p>	\$23,040	\$23,040
	1	<p>A3200-IA-MACHINE-6 AXES-CNC OPERATOR INTERFACE-LABVIEW-MAINTENANCE-5 YEARS-CURRENT-USB A3200-IA: Software based Automation controller with Integrated Development Environment, Parameter Editor, Tuning Scope, System Diagnostics, and System Maintenance. Full part number includes options listed below. Pricing is summation of selected products. Maintenance (software update) included in price for one year from date of purchase. A3200 is intended for deployment on desktop or industrial PC's. See website for PC specifications. The A3200 requires activation and can be installed on only one PC per purchased copy. Additional licenses for "off-line" application development are available for 75% off standard list price. The CNC-OI option must be used for applications that require a native language user interface. -MACHINE: A3200 installation on a single PC. Additional licenses must be purchased when installing on more than one PC. Provides the ability to: - Write, compile, execute, debug programs in Aerobasic or G-code - Full access to .NET 2.0, or C - Access full diagnostics, fault, and status information - Access and set I/O, registers, and variables - Collect, analyze and save data - View files from machine for analysis and record keeping - Connect PC to machine directly with FireWire card - Connect PC to machine remotely through Ethernet TCP/IP - Upgrades can be installed (firmware or controller) using Loader - 2 axis of software motion engine - Simulate trajectory on PC - Installs Intime on the PC -6 AXES: Software only motion, robotics, and I/O controller. Provides 6 axes coordinated motion -CNC OPERATOR INTERFACE: Man-machine interface CNC software for Win 7. This includes the CNC option. Includes user manuals, technical manuals and cable drawings for all related equipment. -LABVIEW: Includes LabVIEW 2010 VI samples - MAINTENANCE-5 YEARS: 5 year of maintenance is included with the initial purchase. Additional years can be purchased. -CURRENT: Current released version of software USB: USB installation Media</p>		
	1	<p>NFire-PCIE 2-port FireWire OHCI compliant PCI-Express interface card</p>		
	1	<p>NConnect-4500-66 FireWire cable, 4.5M (15 feet) long, 6 pin to 6 pin</p>		

1 **NPAQ-A-80B-80B-ULTRA/1to5 DP32020E/6 BLANK/SPLIT BUS 1-6 (NO SPLIT)-STAND-US-115VAC-STANDARD-BRAKE4-ESTOP2-TRIPLEPSO-MXR6-M6**

Rack mount digital amplifier chassis with integral DC power supply and FireWire interface. Supports up to 6 axes of brush, brushless or stepper motor amplifiers. Includes:

- 8 opto-isolated digital inputs
- 8 opto-isolated digital outputs
- 4 16 bit differential analog inputs
- 2 16 bit analog outputs
- Estop sense input
- 6 channels of 40Mhz quadrature encoder input (analog input optional)

-A: 115 VAC

-80B: ±80 VDC (325 W Power Supply), bipolar

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-ULTRA: 6 axis control board

-DP32020E: Brushless motor driver, 320V, 10A cont., 20A peak, 20kHz PWM, 3U height, improved current feedback, requires A3200 version 2.13 or greater.

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-BLANK:

-SPLIT BUS 1-6 (NO SPLIT): Axis 1-6 Vbus1

-STAND: Built in fan pulls cooling air from left side through the amplifier

-US-115VAC: U.S. 115VAC line cord

-STANDARD: Rack Mount

-BRAKE-4: Brake control logic and power supply

-ESTOP2: Internal ESTOP, controller decels motors to stop then bus power. Meets EN ISO 13849-1 Category 3, Performance Level d capable. Actual risk assessment is responsibility of user.

-TRIPLEPSO: Triple axis PSO

-MXR-6: 16,384x (65,536 after quadrature) multiplier for 6 axes, 200 kHz

-M6:NPAQ 6 AXIS MOTOR OUTPUT

5 **C19801-50**

Motor power cable, 5.0 meters long

-Motor type: Brushless

-Motor/stage connector: 4 pin high power D

-Controller/drive rack connector: 5 pin high power D

-Maximum cable length: 45 meters

-Not rated for continuous flex

5 **C16501-50**

Feedback cable, 5.0 meters long

-Motor type: Brushless

-Motor/stage connector: 25 pin D

-Controller/drive rack end: 25 pin D

-Maximum cable length: 12 meters

-Not rated for continuous flex

1 **JI**
-J1: 4-way industrial joystick sealed for harsh environments. Includes 1.5 m (5 ft) cable and three dedicated function buttons.

1 **JP4X-15**
Joystick extension cable, 15 feet long for use with NPAQ

5 **INTEGRATION - TEST AS SYSTEM**
Document, configure, and test components as a system. Intended for testing of components that are going to be used together in a complete and specific system configuration.

3 1 **SHIPPING COST**
DAP Shipment includes Shipping Cost and Insurance from Aerotech USA to National Taiwan University

4 8 **START-UP SERVICE / TRAINING** \$120 \$960
Detailed system and software training available at Aerotech's facility in Pittsburgh, PA, at your site or online. Training can be customized to fit the needs of any user, from novice to expert. Price shown here is based on the Taiwan hourly rate. Transportation and lodging is not included.
Setup and optimization of your system the most efficient way. Have an expert onsite to start-up. Price shown here is based on the Taiwan hourly rate. Transportation and lodging is not included.
Date of completion the 8 hours training: Within warranty period

5 1 **AEROCARE (1250 x 1250 mm gantry)** \$5,920 \$5,920
Extend the standard warranty for both components and systems for an additional 1 year. Several alternative options are available to fit any budget.
<http://www.aerotech.com/global-technical-support/repair-and-return.aspx>

Aerotech, Inc warrants its products to be free from harmful defects caused by faulty materials or poor workmanship for a minimum of one year from date of shipment from Aerotech.

The AEROTECH option is to extend the standard warranty for both components and systems from 1 year to 2 years.

NOTES.

Duty and VAT

The price listed in above does NOT include import duty and VAT, NTU will be responsible of applying for the free import certificate.

SYSTEM TOTAL (List Price) - 1250x1250mm Gantry System: \$162,850

OPTIONAL SERVICES:

Check Aerotech's User Knowledge Base (FAQ) for answers to the most common questions about our products. The Customer Service website also provides instant access to hardware and software manuals, software releases, 3D drawings, online help files, and more.

<http://www.aerotech.com/global-technical-support.aspx>

Credit terms are established upon placement of order after credit review and approval. A minimum 25% deposit is due upon placement of the first order with new customers. A minimum 25% deposit is due upon placement for all orders which include nonstandard items. The warranty is in accordance with the terms stated in the Aerotech Warranty and Field Service Policy.

Payment Term:

50% NET30 after drawing approval

50% NET30 after acceptance, acceptance will be no longer than 30 days after receipt of order.

Acceptance Criteria

1. 原廠測試報告
Aerotech factory test report
2. 外觀尺寸驗收 (機台底座尺寸)
Base Plate dimension check (+/- 3 mm tolerance)
3. 軟體安裝
Software installation
4. 機台操作 (回原點/移動全行程)
Machine operation (homing routine / jogging for full travel)
5. 圖型化人機介面操作, 各按鍵動作正確
Operate Graphical interface, buttons are operational
6. XY 斜線路徑移動. 速度與加速度未定義 (但在規格書範圍內), 動作正確.
XY diagonal motion, stroke is not defined, and speed and acceleration is not defined (but within specification), diagonal motion operational.
7. 任何 Aerotech 提供的 Demo 程式動作
Any Aerotech demonstration program to show two axes motion

完成這七個驗收條件後, 即定義為驗收.

Upon the completion of the above 7 acceptance criteria, system is considered as verified.

Lead-Time:

3-4 weeks for first approval drawing to be ready.

Then approval time will be subjected to the customer, how much time does the customer need to approve the drawing.

Ship 18-20 weeks after approval.

Total : 21-23 weeks + Approval time

(i.e. If the approval time is 2 weeks, total will be 23-25 weeks)

For new Engineering Special (ES) systems, production does not begin until customer approval of system drawings has been received. A forecast delivery date will be provided on the order acknowledgement once the system has been scheduled.

Lead-Time Note: The estimated delivery dates listed above are based on Aerotech's existing business conditions at the time of quotation. Changing business conditions, component availability, and timing of order may impact the final delivery date. Please consult your Aerotech Application Engineer at time of order for confirmation of estimated lead times.

If you have any questions, please feel free to contact me.

Best regards,

AEROTECH Taiwan

William Yeh / Branch Manager

Email: wye@erotech.com

Web: <http://www.aerotech.com>

Tel: +886-2-85026651

Fax: +886-2-66021266

Cell: +886-923-730210

CONDITIONS OF SALE

1. As used here in, the term "order" means the purchase order or other document placing an order for goods, to which the quotation or acknowledgment relates. The term "goods" means the products, materials, or services which are the subject hereof. The terms hereof are a part of the contract for the goods and shall prevail in the event of any conflict between these terms and the terms of the order.
2. All shipment are made FOB / Ex Works carrier at the point shown herein or in accompanying documents. Title and all risks of loss or damage to the goods will pass to the Purchaser upon delivery to carrier.
3. Credit terms are established upon placement of order after credit review. A minimum 25% deposit due on first order with new customers. The warranty is in accordance with the terms stated in the Aerotech Warranty and Field Service Policy. All orders are subject to the approval of Aerotech's credit department.
4. Unless otherwise agreed, we reserve the right to make deliveries of all or part of the goods in advance of the times specified. We agree to use our best efforts to meet the delivery schedule but we shall not be held liable in the event of delays in delivery or failure to deliver when due to conditions beyond our control. In such event our time for performance shall be extended for a period equivalent to the time consumed in eliminating such cause for delay.
5. Aerotech, Inc warrants its products to be free from harmful defects caused by faulty materials or poor workmanship for a minimum of one year from date of shipment from Aerotech. Aerotech's liability is limited to replacing, repairing or issuing credit, at its option, for any products, which are returned by the original purchaser during the warranty period. Aerotech makes no warranty that its products are fit for the use or purpose to which they may be put by the buyer, whether or not Aerotech's products are specifically designed and/or manufactured for buyer's use or purpose. Aerotech's liability on any claim for loss or damage arising out of the sale, resale or use of any of its products shall in no event exceed the selling price of the unit.

THE EXPRESS WARRANTY SET FORTH HEREIN IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, BY OPERATION OF LAW OR OTHERWISE. IN NO EVENT SHALL AEROTECH BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES.

Aerotech's Warranty and Field Service Policy is incorporated herein by reference.

6. To the best of our knowledge and belief, the prices and other terms hereof conform to all applicable government regulations. We reserve the right to modify or withdraw any quotation if any term or provision thereof conflicts with or violates such regulations.
7. Except where otherwise expressly agreed, all patterns, tools, jigs and fixtures required in the performance of the order, notwithstanding any charges, therefore, shall be and remain our property and in our possession and control.
8. All materials or equipment owned or furnished by the Purchaser while in our possession will be carefully handled and stored by us, but we shall not be responsible for accidental loss thereof or damage thereto.
9. Cancellation in whole or in part of the order, or changes therein, can be made only with our consent and upon terms that will indemnify us against loss, and afford us an equitable profit.
10. The Purchaser agrees to pay, or to reimburse us for, any taxes (except Income Tax) levied by any taxing authority upon the goods, or in respect to the production, manufacture, transportation or sale thereof.
11. If the Purchaser becomes insolvent or is in default under the terms of this or any other agreement between the Purchaser and ourselves, we shall be entitled at our option to discontinue further performance of all or part of the order in addition to any and all other rights and remedies provided by law or equity and available to us in such event.
12. Unless otherwise specified all quotations are for immediate acceptance and are subject to prior sale of the goods and to withdrawal without notice. All orders are subject to acceptance by us in writing at our office at Pittsburgh, PA and no order shall be binding upon us unless so accepted.
13. We warrant that any goods comprising one of our regular line of products are delivered free from patent infringement when used for normal purposes. When otherwise used or when goods are manufactured by us to the Purchaser's designs or specifications, we assume no liability for actual or alleged patent infringement and the Purchaser in such event shall hold us harmless from any and all claims, suits, damages or expenses by reason thereof.
14. In the event that the order is a subcontract under a prime Department of Defense contract of the United States Government, the foregoing conditions are hereby modified to include such portions of the Armed Services Procurement Regulations (as amended at the time of acceptance of the order) as are applicable hereto.
15. The foregoing constitutes full statement of all terms and conditions of the order. No additions to our modifications of such terms and conditions shall be binding upon us unless approved in writing by an officer of this company. The acceptance by us of any order shall not constitute our acceptance of any terms of the order which conflict with these Conditions of Sale. The construction of any order or agreement relating hereto shall be governed by the laws of the Commonwealth of Pennsylvania.

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